

F-22 Program Delivers Power System Breakthrough

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EDWARDS AIR FORCE BASE, Calif. (AFPN, June 30, 2000) — The F-22 Combined Test Force [CTF] here recently posted program savings of more than \$330,000 with a dramatic new innovation in the testing infrastructure used for the Raptor.

The innovation — described as a technological breakthrough by Vern Renfrow, the F-22 test team's senior facility engineer — is a first-of-its-kind aircraft external DC power system. The system converts standard AC power available in maintenance hangars to a 270 DC volt system required to power the Raptor's avionics systems for ground tests.

One major asset of the next-generation fighter is a unique avionics suite. The F-22 flight test director, Col. C.D. Moore, said an ability to provide electrical power for avionics and electrical system ground testing and other functions is vital to the Raptor's avionics and flight expansion test program.

The F-22 power requirements are not found in any other aircraft, such as the F-15, F-16, B-1, or C-17, which use a 400-hertz system. Furthermore, the Raptor requires a power supply free of frequency variations and fluctuations. Electrical supply systems existing in the F-22 CTF's hangars "simply could not meet the power requirements of the F-22 without severe risk to both the aircraft's avionics and the integrity of the overall test program," Renfrow said.

To fix the problem, Steve Bridgers, the F-22 test team's senior supervisor for fa-

cility maintenance, analyzed existing hangar areas. His survey derived two solutions: regulating input voltage and procuring a converter that would meet F-22 power requirements.

After studying both concepts, Bridgers determined that neither option could be practically accomplished given hardware currently available in the aircraft industry. However, believing that use of a power converter was the proper method to solve the problem, Bridgers then developed a solid state power converter that would meet the test team's need.

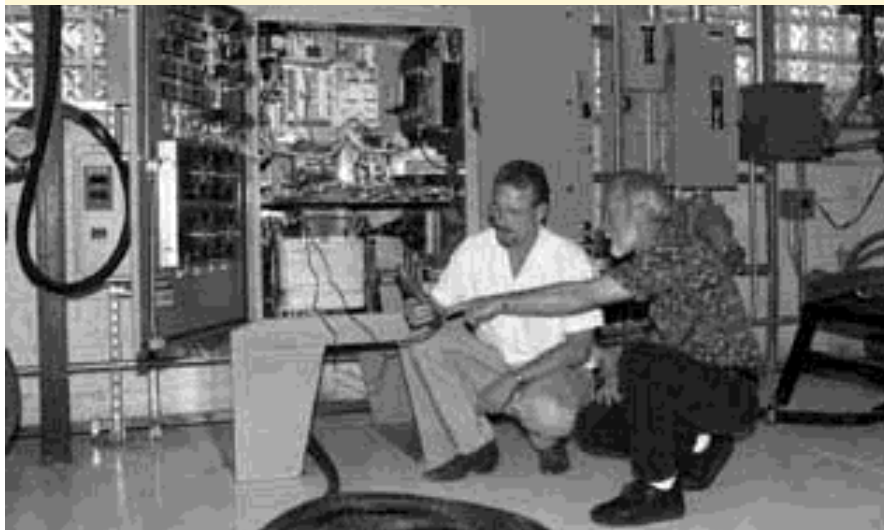
Bridgers' design — which Moore said is a first-of-its-kind application — provides power the F-22 needs and is the most efficient system of its kind in the aviation industry. Unlike all other converter systems, it's capable of operating con-

tinuously at full load, and even under the hottest desert climate conditions. Moore said, the system "has far exceeded all F-22 CTF requirements."

Renfrow noted the new system takes up far less space than other design proposals, and it can power both the aircraft's avionics and systems simultaneously without a decrease in efficiency, with one power converter replacing the five portable power carts currently required to power the F-22 independently of hangar power supplies. Since its adoption, it has been a key ingredient of success to the F-22's logistics test program.

The new system paves the way for future testing of 21st century aircraft to include the Joint Strike Fighter and others that may soon undergo flight testing in the skies over Edwards.

Steve Bridgers and Vern Renfrow of the F-22 Combined Test Force, examine an external DC power system for the F-22 Raptor. A first-of-its-kind application, the system provides power the F-22 needs and is the most efficient system of its kind in the aviation industry. It is also capable of operating continuously at full load, under the hottest desert climate conditions.



Haire is with the Public Affairs Office, Air Force Flight Test Center, Edwards AFB, Calif. This information is in the public domain at www.af.mil/news.